

REMARKS

By the present amendment, claim 5 has been amended to delete the phrases introduced by “preferably,” which are now recited in claim 13, as indicated in the response to the previous Office Action. It is submitted that the correction is immediate and does not raise any new issue. Accordingly, entry and consideration of the amendment is respectfully requested.

Claims 1-14 are pending in the present application. Claim 1 is the only independent claim.

I. Indefiniteness rejection of claims 5 and 13

In the Office Action, claim 5 is rejected under 35 U.S.C. 112, second paragraph, as indefinite because of the phrases introduced by “preferably.” Claim 13 is also included in this rejection as dependent on claim 5.

Applicant’s representative apologizes for the omission in the response to the previous office Action. The phrases introduced by “preferably” have now been canceled in claim 5, as they are recited in claim 13. Accordingly, it is submitted that the rejection should be withdrawn.

II. Art rejections

In the Office Action, claims 1, 3, 5, 7, 8, and 11-14 are rejected under 35 U.S.C. 103(a) as obvious over EP 0985807A1 (“EP’807”) in view of U.S. 4,335,849 to Van Bashuysen (“Van Bashuysen”) and further in view of US 20020078681A1 to Carberry et al. (“Carberry”).

Further, claims 2, 4, and 6 are rejected under 35 U.S.C. 103(a) as obvious over EP’807 in view of Van Bashuysen and Carberry, further in view of US2003/0136113A1 to Nakagawa et al. (“Nakagawa”).

Also, claim 9 is rejected under 35 U.S.C. 103(a) as obvious over EP'807 in view of Van Bashuysen and Carberry, further in view of US 2001/0013409A1 to Burk et al. ("Burk").

Reconsideration and withdrawal of the rejections is respectfully requested.

In the presently claimed invention, the heat exchanger is located downstream from a depollution means comprising both (1) a catalyst and (2) a particle filter. In other words, the presently claimed invention requires that the heat exchanger be located downstream from the particle filter.

First, it is submitted that, firstly, EP'807 does not discuss any particle filter, so EP'807 does not provide any motivation, guidance or incentive to add a particle filter. Second, even if, arguendo, a person of the art attempted to use a particle filter such as the particle filter of Carberry in the system of EP'807, that person would not place the particle filter just after the pre-catalyst 4 of EP'807, but the particle filter would be placed downstream of the main catalyst 5 of EP'807.

Namely, it is submitted that the person of ordinary skill in the art would recognize that catalyst 46 of Carberry, downstream of which Carberry disposes its the particle filter, corresponds to the main catalyst 5 of EP'807, not the pre-catalyst 4.

Reference is made to the machine-translation of EP'807 submitted with this paper.

More specifically, the pre-catalyst 4 of EP'807 is intended for low-temperature initiation while the main catalyst 5 is intended for high-temperature operation (see, e.g., EP'807 at paragraphs 0003-0005). A person of the art would recognize that it would be inefficient to associate a particle filter with the pre-catalyst, because the pre-catalyst would not be expected to

attain reliably the high temperatures adequate for triggering regeneration of the particle filter, as explained in Carberry, for example at paragraphs 0002 and 0022.

In addition, regarding the pre-catalyst 4 of EP'807, this pre-catalyst is designed for the cold start phase, and the heat exchanger is positioned so as to recuperate heat from the heater 6 during the cold start (see EP'807 at paragraphs 0007-0011). Thus, there would have been no incentive to dispose a particle filter downstream of the pre-catalyst and upstream of the main catalyst in EP'807, because this would have required extensive modification of the size and operation of the pre-catalyst, in order to operate the particle filter appropriately during other phases. In contrast, the main catalyst 5 of EP'807 is designed for operation during non-transient phases, which corresponds to the purpose of the catalyst in Carberry, so no extensive modification would be required.

Also, EP'807 mentions that the main catalyst 5 is a NO_x trap (see EP'807 at paragraph 0018), from which it may be inferred that the pre-catalyst is not. This would also have reinforced the understanding that the pre-catalyst 4 is specific for heating during cold start whereas the main catalyst 5 of EP'807 is "the" main catalyst appropriate for combination with a particle filter as in Carberry.

The assertion at pages 5-6 of the Office Action that a person of the art would have been motivated to place a particle filter upstream of the heat exchanger to avoid a clogging problem in the heat exchanger is respectfully traversed. It is submitted that there is no element in the cited references suggesting a clogging problem. In particular, EP'807 is completely silent regarding any clogging problem. Even if, arguendo, a person of the art had considered on his or her own

the clogging issue in connection with the placement of the particle filter (which is denied, as the cited references do not support raising this issue), it is submitted that this issue would not have been significant, as compared to the difficulties of re-purposing the pre-catalyst 4, both in size and operating modes, without any guidance or incentive from EP'807, as discussed above. For example, the person of ordinary skill in the art would have had no guidance as to the effect the particle filter would have had on the heat transfer with the heat exchanger if operation of the pre-catalyst 4 is insufficient to trigger combustion of the soot. Thus, the person of the art would have been led away from positioning the particle filter of Carberry just downstream of the pre-catalyst.

In summary, it is submitted that the person of the art would consider catalyst 46 of Carberry as similar to the main catalyst 5 of EP'807, not the pre-catalyst 4, for correct operation of a particle filter. As a result, any combination of EP'807 and Carberry would have resulted in the particle filter being located downstream of the heat exchanger.

In contrast, in the presently claimed invention, the heat exchanger is placed in the exhaust system downstream from the depollution assembly in the exhaust gas flow direction, wherein the depollution assembly comprises a catalyst and a particle filter, as recited in present claims 1 and 8.

Advantages of this feature relate in particular to (i) the opportunity of avoiding loss of heat through the heat exchanger to the detriment of the depollution assembly during unfavorable operation phases, and (ii) the possibility of increasing heat transfer from operation of the particle filter during regeneration phases.

Thus, an advantage of the presently claimed invention is that the heat exchanger does not remove heat from the exhaust upstream of the depollution assembly in situations where the depollution assembly may be difficult to initiate, such as when the environment is cold.

A further advantage is that the operation of both the depollution assembly and the heat exchanger can be improved, in particular in that (i) the depollution assembly can reach initiation temperature more quickly and (ii) the exothermic effect of the depollution assembly can be captured to increase the heat transfer to heat the passenger compartment, as described in the present specification, for example, page 4, lines 21-35 and page 7, lines 13-22.

This feature of the presently claimed invention and its advantages are not taught or suggested in EP'807, and the other cited references fail to remedy this deficiency. Therefore, the present claims are not anticipated by EP'807, and not obvious over EP'807 taken alone or in any combination with the other cited references.

In addition, with respect to the dependent claims, it is submitted that the combined features of each of these respective claims are not taught or suggested in the cited references taken alone or in any combination.

In particular, with respect to claim 2, it is submitted that the injection of additional quantity of fuel as recited in present claim 2 makes it possible to improve the exothermic effect at the depollution assembly, which further improves the heat transfer at the heat exchanger located downstream of the depollution assembly, as described in the present specification, for example, page 4, lines 21-35. The combined features of each of the dependent claims, and in particular the combined features of claim 2, are not taught or suggested in any of the cited

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references. Therefore, each of these respective claims is not obvious over the cited references taken alone or in any combination.

In view of the above, it is submitted that the rejections should be withdrawn.

Conclusion

In conclusion, the invention as presently claimed is patentable. It is believed that the claims are in allowable condition and a notice to that effect is earnestly requested.

In the event there is, in the Examiner's opinion, any outstanding issue and such issue may be resolved by means of a telephone interview, the Examiner is respectfully requested to contact the undersigned attorney at the telephone number listed below.

In the event this paper is not considered to be timely filed, the Applicants hereby petition for an appropriate extension of the response period. Please charge the fee for such extension and any other fees which may be required to our Deposit Account No. 502759.

Respectfully submitted,

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